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A Study on The Effectiveness of Experiential Learning Practices on the Scientific Attitude, Achievement in Science and Different Learning Styles of Secondary School Students

SHORT SYNOPSIS

Submitted in partial fulfillment of the requirement of the degree of

DOCTOR OF PHILOSOPHY IN EDUCATION

to

U.P. Rajarshi Tandon Open University, Prayagraj

by

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ABSTRACT

This study investigates the effectiveness of experiential learning practices in enhancing the scientific attitude, achievement in science, and learning styles of secondary school students. Grounded in Kolb's Experiential Learning Theory, the research emphasizes hands-on experiences, reflection, and active engagement as alternatives to rote learning. Using a single-group pre-test and post-test design, data will be collected from 300 randomly selected students through a science achievement test, a scientific attitude scale, and Kolb's Learning Style Inventory. Statistical tools such as t-tests, correlation analysis, and ANCOVA will be employed to analyze the outcomes. The study aims to determine the impact of experiential learning on students' cognitive growth, classify learners by learning style, and explore the relationship between scientific attitude and achievement. Findings are expected to provide insights for teachers, curriculum developers, policymakers and all stakeholders to foster critical thinking, creativity, and meaningful learning in science classrooms.

29/08/25

Keywords

- Experiential Learning Practices
- Scientific Attitude
- Achievement
- Learning Styles
- Secondary School Students

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Background Of the Problem

With the constantly-changing nature of the labor market and the global ecosystem, it is more important than ever for students to not just learn but also comprehend how to learn. As a result, education must transition away from teaching material and toward how education may be used as an effective tool to encourage students to think critically and analytically. It should cover themes such as how to be multidisciplinary and creative, as well as how to develop, change, and incorporate new information in a unique way.To make the weapon of education an immersive, interdependent and integrated as well, keeping the learner in center of the whole scenario, the primitive, old pedagogy change is crucial. Science is all around us and thus there commences an urgent dire to explore more about it. Although, there is necessity of understanding science for everyday life, students of today's era find it difficult to get its relevance. A good science education is one that is real to the child, true to life, and faithful to science, according to NCF-2005. Being genuine to life means that it must be relevant to future work and should prepare children for life in the future. It also means that it should be understandable to children.

Experiential Learning is a process of learning through experience, we can say learning through hands–on-experiences along with the reflection on their doing. It is distinct from rote or didactic learning as here the learner remains engaged in the whole process. David A. Kolb had contributed in developing the theory of experiential learning on the basis of earlier work of John Dewey, Kurt Lewin and Jean Piaget.

Review of Related Literature

According to the **National Education Policy (2020)**, a number of noteworthy changes to the school curriculum and pedagogical approaches are planned in order to push pupils to take ownership of their learning. In an influential manner, it suggested that experiential learning could function as a bridge to close the achievement gap of identified learning outcomes. The purpose of this paper is to motivate everybody involved to recognize experiential learning at every level.

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Alkan (2016) studied the chemistry and scientific process skills of student teachers. He found that experiential learning had a positive effect on students' achievement levels and that they were more engaged, active explorers and critical thinkers than students who received instruction using traditional teacher-centered methods.

After undertaking a study regarding the scientific attitude, attitude toward science, and science achievement of senior secondary school pupils in Katsina state, Olasehinde and Olatoye (2014) eventually arrived at their conclusion that scientific achievement could not be significantly predicted by scientific attitude.

David Rapaport (2013) recommended that incorporating experiential learning into the present curriculum is solution to many educational problems. By actively participating in their own education, students improve the learning environment.

The work of David Kolbe, who has been honored for having developed the theory of experiential learning, actual-life situations serve as the cornerstone of education and learning as an ongoing endeavor. It highlights how these techniques might be used to create essential connections between the classroom and the outside world.

Operational definitions

According to its operational definition, experiential learning is responsive communication in which culturally competent teachers aid each student in integrating the course contents to their unique cultural setting through their own lived experiences.

Scientific attitude: It is characterized by open-mindedness, honesty, an urge for accurate knowledge, belief in one's ability to learn, an expectation of optimal answers, a desire to learn about scientific developments, and a lack of superstition.

Achievement test : An Achievement test will be developed to test the prior knowledge of students.

Secondary School Students It includes the students studying in secondary schools.

Rationale of the study

Everything on the globe is getting faster and is emerging with an updated form. So, teaching the students based on the daily life and hands-on-experience is the burning dire of present educational scenario. To compete with the global competitive world, students must be given opportunities and they should be able to explore, discover, inquire which makes them actively engaged in the whole learning

process rather than just mugging up the lessons. Work had been done on this in foreign context but in India, it is an emerging concept. Apart from the earlier studies, there exists still a need for studying in depth to prepare a final blueprint for its uniform acceptance, proper controlling and monitoring bodies.

Scope of the study

There is a famous quote by the English poet, John Keats, **"Nothing ever becomes real till it is experienced"** and this statement finds its relevance in the current times. There is no denying that conceptual learning is the foundation of our understanding, but experience is what solidifies it. Because of the shifts in teaching learning practices, the current curriculum should be a mix of many innovative learning practices. It is the future of the modern classrooms, most necessarily for sciences, social sciences and mathematics for inculcating creativity, critical thinking and reflections on own learning.

Statement of the problem

A Study on the Effectiveness of Experiential Learning practices on the Scientific Attitude, Achievement in Science and Different Learning Styles of Secondary School students

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Research Questions

1. What is the Level of Achievement in Science and scientific attitude of the secondary school students?
2. What is the effect of Experiential Learning Practices on the achievement in science and scientific attitude of the secondary school students?
3. What are the differences in the pre-test and post-test of the achievement in science and scientific attitude of the secondary school students?
4. What is the relationship between the achievement in science and scientific attitude among the secondary school students?
5. How can be the different types of learners classified on the basis of Kolb's Experiential Learning Style?

Objectives of the Study

1. To find out the level of achievement in science and scientific attitude of the secondary school students.
2. To determine the effect of experiential learning practices on the achievement in science and scientific attitude of the secondary school students.
3. To find out if there exists any significant difference in the pre-test and the post test of the achievement in science and scientific attitude of secondary school students.
4. To determine the relationship between achievement in science and the scientific attitude among secondary school students.
5. To classify the different types of learners according to Kolb's Experiential Learning Style.

Hypotheses of the Study

1. There is no significant difference in the level of achievement in science and scientific attitude among secondary school students.
2. There is no significant effect of experiential learning practices on the achievement in science and scientific attitude of the secondary school students.

3. There is no significant difference in the pre-test and the post-test of achievement in science and scientific attitude of secondary school students.

4. There is no significant correlation between the achievement in science and the scientific attitude of secondary school students.

5. There is no significant difference in the types of learners according to Kolb's Experiential learning Styles.

Delimitation of the study The study will be delimited to the students of secondary schools.

Population Students studying in secondary schools will constitute the population of the study.

Sample The study is to be done on 300 students. The sample will be drawn randomly from the above mentioned population.

Research methodology

The method used will be descriptive survey method. The study will follow a single group pre- test and post-test design among the secondary school students . The students will be first given a pre-test to assess their existing standards and then after administering the experimental treatment, a post test is administered to find out the effect of the experiment on the science achievement and scientific attitude.

Tools to be developed for the study-An achievement test in science will be developed to test the previous knowledge of the selected sample. A tool on scientific attitude will be used to determine scientific attitude of students. Kolb's learning style inventory-KLSI will be used in the study to understand the different types of learning styles in the chosen sample.

The statistical techniques Measures of central tendency, percentage analysis, test of significance (t-test), correlation analysis, ANCOVA.

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Educational implications of the study

This study is grounded in David Kolb's experiential learning theory. We teach the selected group using hands-on, experience-based methods to spark curiosity and nurture a scientific mindset. By tracking students who learn through this approach, the study carefully examines their academic growth. This helps educators see how students' cognitive abilities improve as a result of the chosen method. It also supports the development of students' scientific attitudes—an essential part of effective science teaching and learning.

29/08/25

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29/08/25

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Author Name	Archie Gaur
Title	A Study on the Effectiveness of Experiential Learning Practices on the Scientific attitude, Achievement in Science and Different Learning Styles of Secondary School Students
Paper/Submission ID	4291519
Submitted by	rjmauryauprtou@gmail.com
Submission Date	2025-08-29 15:28:14
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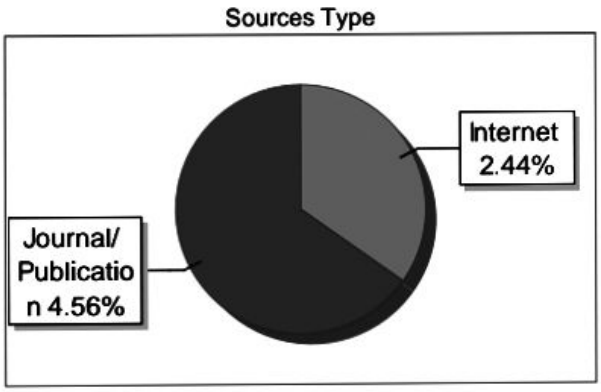

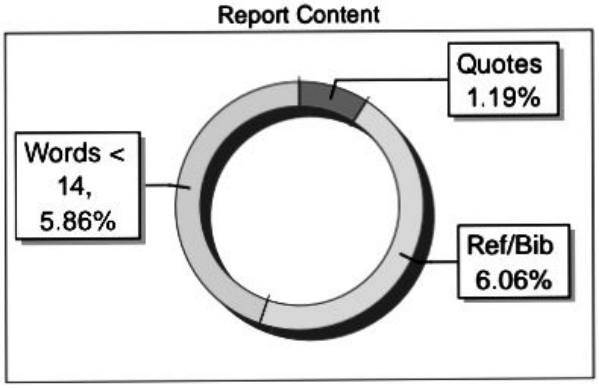

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